Southern California Association of
Marine Invertebrate Taxonomists

3720 Stephen White Drive
San Pedro, California 90731

May - August, 2000

# SCAMIT Newsletter

Vol. 19, No. 1-4

| | |
|---|---|
| **SUBJECT:** | The *Pholoe* and *Notomastus* of the Southern California Introduced Species Survey |
| **GUEST SPEAKER:** | Leslie Harris |
| **DATE:** | 10 October 2000 |
| **TIME:** | 9:00 a.m. to 3:30 p.m. |
| **LOCATION:** | Los Angeles County Museum of Natural History<br>Worm Lab<br>900 Exposition Blvd. |

**8 MAY**

*Lamellaria diegoensis* Dall in Orcutt, 1885
SD-10, 7-21-00, 320 ft.
Photo by K. Barwick, 7/2000

The meeting was held at SCCWRP and the upcoming fourth edition of the SCAMIT species list was reviewed. There were no minutes from this meeting. The group would have divided into two sessions, one dealing with polychaetes, and one addressing all other taxa but too few polychaete folks were in attendance to proceed down that path. A list of proposed changes was considered based on the list of emendations planned or recommended for the third edition. In most cases attendees were able to reach a consensus, but some questions were take home - with examination of specimens required. Much progress was made, but it was apparent that a further meeting would be required to begin consideration of the polychaetes and finish the non-polychaetes. Some persons whose input was essential were not able to attend this meeting. In consequence some questions had to be deferred to a second meeting.

FUNDS FOR THIS PUBLICATION PROVIDED, IN PART BY
THE ARCO FOUNDATION, CHEVRON, USA, AND TEXACO INC.

**30 MAY**

The second meeting for the month was at the LACMNH worm lab. President Ron Velarde started by announcing future meetings. The next meeting will be June 12 at SCCWRP. Participants will be continuing the work on editing Edition 4 of the SCAMIT Species List. On July 10 there will be an anemone workshop at the Dancing Coyote Ranch. Head wrangler John Ljubenkov will be examining and discussing Edwardsids and Cerianthids that were encountered in the Bight'98 project.

Several new job openings were mentioned. The University of Florida at Gainesville is looking for a wetlands biologist. This job is funded by a 5-year contract. The Los Angeles County Museum of Natural History has 2 curatorial positions open in the invertebrate department. The successful applicants will be sorting the large infaunal collection from Puget Sound that was obtained during the old Velero cruises.

Leslie Harris passed around two new polychaete publications. The first one was "Polychaetes and Allies: Fauna of Australia Volume 4A: Polychaeta, Myzostomida, Pogonophora, Echiura, and Sipuncula". It is a large volume (465 pages) and has many colorful plates. The second publication was "A Revision of the Australian Trichobranchidae (Polychaeta)" by Pat Hutchings and Rachael Peart. Leslie commented that it is a great review paper since it covers every family and genus of Trichobranchida of Australia.

Southern California Association of Marine Invertebrate Taxonomists

3720 Stephen White Drive
San Pedro, California 90731

Dear SCAMIT members,

On behalf of the SCAMIT officers and the newsletter editor, I would like to apologize for our recent absence (for lack of a better term) of newsletters. Some of us involved with the writing and production of the newsletter became overwhelmed with work this summer and before we knew what was happening, we were behind on production. Once the journey down this slippery slope began, it was difficult to stop and change directions. So, in an effort to get back on track the following newsletter will be a brief compilation of the last four issues. It will contain minutes from the meetings and various pertinent announcements.

However unfortunate this slip has been it provides a good opportunity for us to request, again, that anyone interested in sending in material for the SCAMIT newsletter, please do so. Ideally, the newsletter should be a synthesis of different announcements, views, opinions, etc. The task of composing the newsletter has fallen almost completely on the trustworthy shoulders of Don Caiden (LACSD), who, as history shows, is a wonderful and prolific writer. However, he (I know personally) would greatly appreciate any help or input that anyone has to offer.

Thank you,

Megan Lilly
SCAMIT Secretary

Next, Don Cadien gave a brief report on the SCAS (Southern California Academy of Sciences) meetings he attended. One of the major areas researched was Santa Monica Bay, and topics included several talks pertaining to geological information as well as urban

influences. The effects of El Niño on local biota were also addressed, and range extensions of several species were documented.

Don told us about a donation of literature by Don Mauer. Four boxes of reprints were donated, consisting mainly of ecological literature. Don will bring these to the next SCAMIT meeting for everyone to peruse.

Larry Lovell then informed us about 2 more meetings. The International Crustacean Meeting will be held at Puerto Vallarta, June 26-30, 2000. Information concerning this meeting can be found at The Crustacean Society website,

http://www.lam.mus.ca.us/~tcs/

The Ichthyologist and Herpetologist Meeting will be held in La Paz in June.

Leslie passed around a jar containing several large specimens of *Chloeia viridis*. They were collected from Santa Catalina Island on May 13, 2000 at a depth of 40-60 feet. This is a northern range extension from Baja, California.

With the business portion of the meeting concluded, guest speaker Vasily Radashevsky took the floor. He was visiting from the Institute of Marine Biology in Vladivostok, Russia. The Institute is located on a peninsula between 2 small bays in the Sea of Japan. Vasily explained that the building itself was completed 10 years ago, and now supports approximately 400 researchers. The waters near the Institute support a rich and diverse polychaete community. Warm water currents flow northward from the Korean coast, creating habitats of various sediment types that support both boreal and tropical species. There are 5 joint biological stations along the coast of Far East Russia, with research being conducted along the coasts of the Sea of Japan, the Sea of Okhotsk, and the Bering Sea.

Vasily Radashevsky started his career in the area of polychaete embryology, studying larvae from the Sea of Japan. His research of polychaete larvae led him to examine all life history stages of polychaetes, so he now works on both embryonic development and larval and adult morphology. He has taken part in several large, international collecting expeditions, including trips to the south coast of Vietnam, Thailand Bay, North Korea, and the Commodore Islands.

He explained that in the early years of taxonomy, descriptions of new species were commonly short and only compared a minimal number of characters to distinguish them from closely-related species. With the discovery of cryptic and sibling species, it became even more difficult to separate these species, and researchers may need to employ molecular techniques to definitively separate them. As we discover more and more species, we are also finding that there are not as many cosmopolitan species as we once thought. Consequently, taxonomists need to use more characters to describe and define new species. Equally important is the work of going back to verify and supplement identifications of holotypes and previously collected specimens.

Vasily first became interested in cladistics and phylogenetic relationships in 1994 while talking with Frederick Pleijel. He said he likes cladistics because it is testable. Vasily has just spent 8 months at the Smithsonian Institute studying spioniform polychaetes. He is working on a manuscript with Kristian Fauchald in which they will describe morphological features, code characters, and then present a cladistic analysis based on 370 characters of these polychaetes. The Spionida were erected in 1962 and contained 10 families. The main character was the presence of anterior palps. In 1997 Fauchald and Rouse reduced the number of Spionida families to 7 in their analysis of Spionida clades. One family was later dropped (Chaetopteridae),

leaving the Apistobranchidae, Spionidae, Magelonidae, Trochochaetidae, Poecilochaetidae, and Longosomatidae as the current families in the order Spionida.

Vasily told us about some paleontological discoveries that may have been ancestors to the Spionida. Fossils were found in New York state that date back 300 million years. They were believed to be a boring species. Discoveries such as this give us an idea regarding how long ago spionid-like animals existed.

Next Vasily reviewed the families and their composition: 1) Apistobranchidae Mesnil and Caullery 1898, 3+ species, 2) Longosomatidae Hartman 1944, 5+ species, 3) Poecilochaetidae Hanerz 1956, 30+ species, 4) Spionidae Grube 1850, ca. 420 species (after Mackie 1996; Vasily believes there may be as many as 1000 species), 5) Trochochaetidae Pettibone 1963, ca. 10 species, 6) Uncispionidae Green 1982, 2 species.

In constructing a cladogram, Vasily and Kristian first looked for synapomorphies which are shared characters from common ancestors. They used the following external and internal systems to look for characters to code: trunk and segment structures, head and head structures, branchiae, pygidium, ciliated structures, chaetal (setal) arrangement and morphology, glands, central nervous system, sensory structures, musculature, digestive system, vascular system, excretory and reproductive systems, larval morphology, and ecology.

It is difficult to code the characters of metameric animals such as polychaetes. One must be careful in choosing appropriate characters and also must use a sufficient number of characters.

We discussed the importance of being consistent with polychaete terminology in order to make valid comparisons between specimens. Vasily has spent considerable time defining morphological terms thereby establishing a consistent, standardized approach. For example, he established a terminology for the pattern and position of spionid chaetae. By using this "scheme," he can score the chaetae (presence/absent scores) for the cladistic analysis.

Vasily commented that the specimens he examined at the Smithsonian Institute were in very good condition. He was able to view external structures as well as internal structures in cross-sections. An example of an internal structure that they coded and used in the analysis was found in *Trochochaeta multisetosa* (Orsted 1843). This species has unique ventral pads with fleshy extensions. In looking at the cross-sections, they could see that these pads were situated adjacent to a nerve cord, implying a sensory function. Characters such as these can be coded and used to determine synapomorphies. Vasily cautioned that one must be careful when coding characters since the process may reflect one's own pre-existing assumptions about homologies.

Vasily gave us his reasons for using species (as opposed to a higher classification level) for their cladistic analysis. He believed the generic breakdown in Spionida is fairly artificial and he cited an example. The setiger number on which branchiae begin is often used to separate genera; however, this character can change with developmental stages and therefore can be misleading in identifying small specimens.

If one is fortunate enough to have live material, differences in palp pigment may be used as a coded character. For example, *Pseudopolydora paucibranchiata* had bright yellow spots on the palps. This widely-distributed species was probably transported with oysters from Japan. Another species, *Polydora brevipalpa*, had paired spots on the branchiae. This species bored into scallop shells.

Vasily continued to give more specific examples of parapodial and branchial characters that were coded and used in the analysis. He discussed the difference between gills and branchiae. Specimens of *Dispio* have lateral gills in which each extension has its own blood loop. These are structurally different than regular branchiae. Some species of *Scolelepis* have lateral gills also. In *Poecilochaetus*, he defined two types of gills, notopodial lateral gills and neuropodial lateral gills.

There is much variation in the chaetae of Spionida. Many species have modified notochaetae, and their position can vary within an individual. In general, there is an increase in the number of modified setae from middle to posterior and a decrease in the number of regular setae. Two species that have modified notochaetae in the posterior are *Dipolydora bidentata* and *D. quadrilobata*. In *D. bidentata*, the tight bundles of spines do not protrude through the body wall whereas in *D. quadrilobata*, the spines do protrude. Vasily distinguished between these two character states.

Pygidial shape was another external character that was analyzed. This can be a tricky character and ideally, one should be familiar with ontogenetic changes in the morphology of the species under consideration. In the case of *Dipolydora cardalia*, for example, juveniles with approximately 40 segments had 4 lobes, and larger individuals with approximately 100 segments had 3 lobes (2 lobes had fused during development).

Neuropodial hooks were the next character addressed. One has to be specific when using the term hook because there are many different shapes and positions. When tridentate hooks were considered, they were coded differently depending on the position of the main fang in relationship to the upper teeth. Another codeable difference in hooks is whether the hoods are internal (as in *Paraprionospio pinnata*), partial, or external. In most polydorids, hooks in anterior segments first appear in post-metamorphic juveniles and then are lost in adults. This ontogenetic information is difficult to obtain, so unfortunately, we do not have it for most species.

Sensory structures such as lateral organs have also been examined although in a limited way. Poecilochaetidae have expanded lateral organs. They are relatively easy to see and compare in histological sections, and it would be informative to do more histological studies on different species.

Although many observations are lacking in the area of Spionida reproductive systems, there are some interesting modes which have been documented. Vasily had seen two types of asexual reproduction. In the first type, a couple of middle maternal segments from an individual form new anterior and posterior ends. In the second type, new segments are added in a linear fashion starting at the anterior end. Complete individuals then break away from the posterior end of the parent.

Species have different structures with reproductive functions that can be coded. The dorsal pouches in the middle portion of *Streblospio benedicti* function as brood pouches, holding the larvae through most of their development. When the larvae are released, they spend a minimum amount of time in the plankton before they settle. Females of *S. benedicti* can also store sperm in anterior segments until the female gametes are mature. Sperm morphology and egg mass shape are two more possibilities for differentiating between species.

Vasily went on to give several examples of character differences in Spionida larval morphology and development.

Ecological traits, such as habitat and vertical distribution, were also discussed.

Vasily stressed the importance of describing the morphological variability when describing a new species. The format he used is to first describe the holotype, then in another section of the paper, describe variability in several other specimens preferably with varying ages. Species descriptions of *Laonice* included the segment number where lateral pouches start and the number of lateral pouches. Vasily has noticed, however, that in some species of *Laonice*, this character varies with age of the animal.

I think I speak for all the meeting participants when I say that it was a pleasure to meet Vasily Radashevsky and listen to his very interesting and informative presentation.

**12 JUNE**

The second SCAMIT species list review was held at SCCWRP. Ron Velarde was the first to have the floor. He announced the July meeting which would take place on 10 July at Dancing Coyote Ranch. The topic would be Cerianthids and Edwardsiids, with a review by John Ljubenkov.

Larry Lovell (SIO) questioned Don Cadien (LACSD) as to the potential for future intercalibration trawls between agencies. Everybody present at the meeting felt that these trawls, in the past, had been helpful to the QA/QC process and kept us "all on the same page" in terms of invertebrate and fish ID's during trawls. Don stated that they have an interest in conducting intercalibration trawls on an annual basis but the lab is still waiting to get official approval for such an exercise.

A few new publications were announced, one being Polychaeta and Allies: the Southern Synthesis (Beesley, Ross & Glasby 2000) from Australia mentioned at the previous meeting by Leslie Harris. The City of San Diego had purchased copies of not only this polychaete volume, but the molluscs as well (which are a two volume set). This new volume continues a standing series, Fauna of Australia, and is Volume 4A in the series. These are not really identification manuals, but discussions of the subject group in many contexts, including behavioral and cladistic. They provide a synthesis of information available on the group, particularly as it relates to the Australian fauna. The utility of the volumes is broad, however, and they would be useful to any southern Californian worker in a covered group.

Don Cadien had the floor next. He announced an upcoming conference - Options for Dredged Material Disposal Management. It is a conference and workshop and will be held at the Massachusetts Institute of Technology (MIT) in Cambridge Mass, on 3 - 6 of December, 2000.

In regards to the SCAMIT species list, the same pattern as last month was repeated. We separated into two groups and discussed polychaetes and non-polychaetes separately. Ron Velarde, Tony Phillips and Dean Pasko were floaters, moving between the two groups. Nearly all of the problems remaining from the last meeting were resolved. Even so a few persisted. They are to be handled individually by consultation between the parties concerned in each individual case. The timing of the release of Edition 4 was pushed back to allow further time to answer the remaining questions and to finish preparation of voucher sheets for new or different forms encountered in B'98. Provisional forms for which voucher sheets have not been submitted for publication in the Newsletter will not be included in Edition 4, and will have to wait for Edition 5.

**10 JULY**

The meeting at Dancing Coyote Ranch went quite well and Dean Pasko (CSD) took notes for the Secretary who was away at the AMS/WSM conference. Following are Dean's minutes.

In attendance: Dean Pasko, Tony Philips, Don Cadien, Ananda Ranasinghe (SCCWRP), John Ljubenkov.

The business portion of the meeting was canceled because no officers were present. However, it was announced that Ann Dalkey will be retiring from the Treasurer position. Those of you who've always wanted to be treasurer of SCAMIT, next year will be your chance.

Don Cadien then distributed a draft of the SCAMIT sp. list Ed 4 for comments. Comments on the draft are due by first week of August, as he hopes to have a final draft done by end of that month.

It was announced that the Introduced species survey is to begin in August with Andy Cohen, John Ljubenkov, Don Cadien, Leslie Harris, and others (further information and a more complete listing of participants are covered in the upcoming September newsletter).

The taxonomic portion of the meeting had, as its focus, presentation of the materials prepared by John Ljubenkov as part of his specialist identification of edwardsiid and cerianthid anemonies during B'98. John was looking for feedback from users prior to submission of his final product. We began with the Edwardsiids. Some general characters of the family Edwardsiidae include:
- 8 way symmetry (as opposed to 6 in most other anemones, and 4 in Cerianthids)
- nemathybomes present or absent
- physa present, though in *Scolanthus* it is undifferentiated and is termed the "base". The physa acts as an anchor to allow rapid contraction of the column into the sediments.
- all have a terminal pore through which water is extruded when an individual must contract rapidly.

*Metedwardsia* sp. A is not included in the key because there were not enough large specimens from the Bight'98 project to yield sufficient data to provide a good description. *Metedwardsia* sp. A has 8-way symmetry, a true physa, and no nemathybomes.

*Scolanthus* sp. A differs from other Edwardsiids in the absence of a true "physa" and the continuation of the nemathybomes onto the "base". John noted that Manuel (1981) was wrong in his assertion that *Scolanthus* has a true physa. John agrees with Carlgren (1949) in this respect and refers to this portion of the animal as the "base".

Living specimens have red spots at the base of the tentacles. Similar structures have been shown to be light sensitive in other species of anemone. John has observed live *Scolanthus* sp. A and noted that the tentacles do retract when exposed to light.

*Edwardsia californica*, *Edwardsia* sp G, and *Scolanthus* sp. A overlap in occurrence from 5 - 10 m of water. *Edwardsia* sp. G —which may turn out to be *Edwardsia sipunculoides* — has the widest distribution of any species on the Pacific Coast. *Scolanthus* sp. A and *Edwardsia* sp. A have only been found in the Southern California Bight. *Edwardsia* sp. A is restricted to slope depths, having only been sampled in sediments over 200 m deep with higher abundance in 1000 m water.

*Edwardsia californica* has a retractile physa, which, when retracted, can create confusion with *Scolanthus* sp. A. The distinguishing character being in the distribution of the nemathybomes. In *E. californica* the nemathybomes stay in clean, straight rows whereas in *Scolanthus* sp. A they tend to scatter as you move closer to the base.

Dean noted difficulty in distinguishing *E. californica* from *Edwardsia* sp. G. He commented that he saw little difference in the nemathybome size and shape. John placed the two species side by side and there was a



distinct difference in size, with *Edwardsia* sp. G approximately one-third the size of *E. californica*. Additionally, when viewed side by side the difference in the distribution of the nemathybomes was quite evident. Difficulty will likely arise for those attempting to make these distinctions without the benefit of having made a side-by-side comparison and/or in dealing with small specimens of *E. californica*.

Page 1of John's handout included a table of nematocyst distribution in the various structures for the Edwardsiids in question. John used the nomenclature from Carlgren (1949), noting that recent studies have demonstrated that nematocyst size measurements represented a continuum and therefore are not useful in describing nematocyst types. Consequently, John was left with the general terminology to distinguish types. The dissections were difficult and consequently the table should be used with some caution. (NOTE: This statement is inferred from my query as to whether or not this table could be used to distinguish *E. californica* from *Edwardsia* sp. G based on the difference in nematocyst distribution. John could not provide a definitive yes/no, and commented that he was not 100% sure that when dissecting out tissue he was getting only the targeted organ, i.e., nemathybome.)

After John presented his key to the species we reviewed specimens and tissue sections of *Scolanthus* sp. A which John had made while working at the Alan Hancock Foundation, and entire specimens of each of the species included in John's key.

We then moved on to the *Ceriantharia*. John expressed some frustration in dealing with these poorly understood animals. The cerianthid literature suggests that the mesenteries occur in quartets, but even after reviewing many specimens, John has not been able to figure out this 4-part system. A certain degree of confusion results from the frequently twisted and contorted nature of preserved specimens which makes counting mesenteries extremely difficult. Further, John has encountered cerianthids with one specimen developing within the endocoel (body cavity) of another. In these cases the mesenteries of the "host" were often altered. In one or more cases John has seen a large cerianthid hosting an equally sized boarder where the host specimen has lost all its mesenteries. Such circumstances, combined with the frequently contorted bodies of preserved specimens, have served to thwart John's attempts at understanding the mesentery arrangement.

John's most important references include Carlgren **(**1949**)** the most complete treatment of the group; den Hartog (1977), the best modern reference; and Torrey and Kleeburger (1909), a reference for the Southern California species *Pachycerianthus aestuari*, *P. johnstoni*, and *Botruanthus benedeni*.

Tony raised the question of why *Ceriantharia* sp. C was not included in the key. John has not seen the species in quite some time and it was not encountered in the Bight'98 samples. Tony, however, does still see it in Santa Monica Bay. This species is distinguished by the abrupt end of the mesenteries mid-way down the column.

After this portion of the meeting was complete, Dean Pasko showed a sea pen (Pennatulacea: Virgularidae) with characters that did not match either *Virgularia californica* or *V. bromleyi*. This specimen was of decent size, with leaves bearing few polyps (approximately 3 - 6) (like *V. bromleyi*), pigmented at their base (like *V. agassizi*), but contained siphonozoids oriented longitudinally along the rachis. This combination of characters had not been seen by anyone in attendance at the meeting. Dean asked members operating in the SCB to be on the look-out for this odd species.



## AUGUST MEETING

Unfortunately the August meeting was canceled and so with that we are now up to date. The minutes of the September meeting will be covered in the upcoming September Newsletter, along with many other interesting topics.

## JOB OPPORTUNITY

Marine Sediment/Benthic Ecologist Sought! Specialist in Marine Sediment/Benthic Ecology wanted to fill permanent, full time position as a member of the Washington State Department of Ecology's Marine Sediment Monitoring Team, conducting studies to evaluate conditions and trends in the marine sediments of Puget Sound and Washington's coastal estuaries. For program description, visit:

http://www.ecy.wa.gov/programs/eap/mar_sed/msm_intr.html

Responsibilities: Development of study designs and preparation of project planning documents (Quality Assurance Project Plans, Project Implementation Plans); plan and participate in field sampling events to obtain marine sediment for toxicity, chemistry, and infaunal invertebrate analyses; analyze marine sediment data to determine ambient conditions, including spatial and temporal trends in sediment quality; prepare technical reports and scientific publications; present findings at meetings; and seek opportunities for collaboration and outside funding to benefit and augment efforts to assess marine sediment quality. Desirable Expertise: MS or PhD in marine sediment/benthic ecology, with experience in sediment toxicology, sediment chemistry, and/or infaunal invertebrate ecology; strong writing and analytical skills; and proven ability to work as a friendly, engaged, fully integrated and cooperative team member.

Salary Range: $3337-4270/month
Contact: Send CV and cover letter to,
Maggie Dutch
Washington State Dept. of Ecology
300 Desmond Drive, PO Box 47710
Olympia, WA 98504-7710.
Phone: 360-407-6021, FAX: 360-407-6884,
mdut461@ecy.wa.gov.

Must be an active candidate in the WA State Environmental Specialist 4 & 5 Eligibility Pool (1-9-087-OC GF). See the WA State Department of Personnel website for details on how to enter this eligibility pool:

http://www.wa.gov/dop/bulletins/19087oc.htm

The Department of Ecology actively supports diversity in the workplace. Women, racial and ethnic minorities, persons with disabilities, disabled veterans, and Vietnam-era veterans are all encouraged to apply. Disabled persons needing application/testing/interviewing assistance may call (360)407-6186 or (360)407-6206 (TDD).

## UPCOMING NAMIT WORKSHOPS

**October 28, 2000** - Cirratulidae polychaetes and problem species.
- Howard Jones and Eugene Ruff.
- Vancouver Aquarium

**Feb-Mar., 2001** - Assortment of problem gastropoda and some Ophiuroid discussions.
- Speaker to be announced.
- Seattle area.

**June 8 or 9, 2001** - Teeny Weeny Bivalves and how to tell them apart.
- Val Macdonald or other intrepid soul.
- Vancouver or Surrey, B.C.

## BIBLIOGRAPHY

Beesley, P.L., Ross, G.J.B. & Glasby, C.J. (eds) (2000). Polychaetes & Allies: The Southern Synthesis. Fauna of Australia. Vol. 4A Polychaeta, Myzostomida, Pogonophora, Echiura, Sipuncula. CSIRO Publishing: Melbourne xii 465 pp.

Carlgren, Oscar. 1949. A survey of the Ptychodactiaria, Corallimorpharia and Actiniaria. Kinglinga Svenska Vetenskapsakademiens Handlingar, ser. 4 1(1): 1-121.

den Hartog, J. C. 1977. Descriptions of two new Ceriantharia from the Caribbean region, *Pachycerianthus curacaoensis* n. sp., and *Arachnanthus nocturnus* n. sp., with a discussion of the cnidom and of the classification of the Ceriantharia. Zoologische Mededelingen 51(14): 211-242.

Fauchald, Kristian and Greg Rouse. 1997. Polychaete systematics: Past and present. Zoologica Scripta 26(2):71-138.

Hutchings, Pat and Rachael Peart. 2000. A Revision of the Australian Trichobranchidae (Polychaeta). Invertebrate Taxonomy 14, 225-272.

Mackie, Andrew S. Y. 1996. Taxonomy and phylogeny of spioniform polychaetes (Annelida). Doctoral dissertation; Göteborg University, Göteborg, Sweden. 41pp. + attachments.

Manuel, R. L. 1981. On the identity of the sea anemone *Scolanthus callimorphus* Gosse, 1853 (Actiniaria: Edwardsiidae). Journal of Natural History 15: 265-276.

Torrey, Harry Beal and F. L. Kleeberger. 1909. Contributions from the laboratory of the Marine Biological Association of San Diego, XXVII. Three species of *Cerianthus* from southern California. University of California Publications in Zoology 6(5): 115-125.

**Please visit the SCAMIT Website at:** http://www.scamit.org

**SCAMIT OFFICERS:**

If you need any other information concerning SCAMIT please feel free to contact any of the officers e-mail address

| | | | |
|---|---|---|---|
| President | Ron Velarde | (619)758-2331 | rgv@mwharbor.sannet.gov |
| Vice-President | Leslie Harris | (213)763-3234 | lhharris@bcf.usc.edu |
| Secretary | Megan Lilly | (619)758-2336 | msl@mwharbor.sannet.gov |
| Treasurer | Ann Dalkey | (310)648-5544 | cam@san.ci.la.ca.us |

Back issues of the newsletter are available. Prices are as follows:

Volumes 1 - 4 (compilation)..... $ 30.00
Volumes 5 - 7 (compilation)..... $ 15.00
Volumes 8 - 15 ..... $ 20.00/vol.

Single back issues are also available at cost.